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**TRANSMITTAL  
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Application Number	10/698,182
Filing Date	October 30, 2003
First Named Inventor	KARLSSON et al.
Art Unit	
Examiner Name	
Attorney Docket Number	200311961-1

Total Number of Pages in This Submission

**ENCLOSURES (Check all that apply)**

<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please Identify below): <b>Two Return Postcards and 20 References</b>
<b>Remarks</b>		

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm or Individual name	Derek J. Westberg (Reg. No. 40,872)
Signature	
Date	Feb 5, 2004

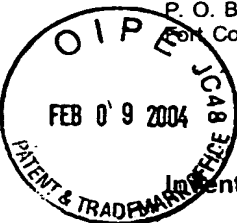
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Typed or printed name	Daniel Ratoff		
Signature		Date	Feb 5, 2004

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): KARLSSON et al.

Confirmation No.:

Application No.: 10/698,182

Examiner:

Filing Date: 10/30/2003

Group Art Unit:

Title: METHOD OF SELECTING HEURISTIC CLASS FOR DATA PLACEMENT

COMMISSIONER FOR PATENTS  
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

This Information Disclosure Statement is submitted:

- ☒ under 37 CFR 1.97(b), or  
(Within three months of filing national application; or date of entry of national application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97 (c) together with either a:  
☐ Statement under 37 CFR 1.97(e), or  
☐ a \$180.00 fee under 37 CFR 1.17(p), or  
(After the CFR 1.97 (b) time period, but before final action or notice of allowance, whichever occurs first)
- ☐ under 37 CFR 1.97 (d) together with a:  
☐ Statement under 37 CFR 1.97(e)(1) or (2), and  
☐ a \$180.00 fee set forth in 37 CFR 1.17(p).  
(Filed after final action, a notice of allowance, on or before before payment of the issue fee)

Please charge to Deposit Account **08-2025** the sum of \$0.00. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **08-2025** pursuant to 37 CFR 1.25.

☒ Applicant(s) submit herewith Form PTO 1449 - Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form 1449, as presently understood by the individuals(s) designated in 37 CFR 1.56 (c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on form PTO 1449 and is enclosed herewith.

It is requested that the information disclosed herein be made of record in this application.

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OR

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Number of pages: \_\_\_\_\_

Typed Name: Daniel Ratoff

Signature:

Respectfully submitted,

KARLSSON et al.

By

Derek J. Westberg

Attorney/Agent for Applicant(s)

Reg. No. **40,872**

Date: **02/05/2004**

Telephone No.: **(408) 293-9000**

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR  
APPLICANT'S INFORMATION DISCLOSURE  
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

200311961-1

APPLICATION NO.

10/698,182

CONFIRMATION NO.

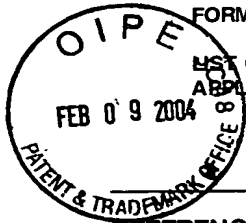
APPLICANT

KARLSSON et al.

FILING DATE

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GROUP



## REFERENCE DESIGNATION

## U.S. PATENT DOCUMENTS

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	1L					
	1M					
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## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

✓	1Q	Sugih JAMIN, Cheng JIN, Anthony R. KURC, Danny RAZ and Yuval SHAVITT, Constrained Mirror Placement on the Internet, INFOCOM, 2001.
	1R	Magnus KARLSSON and Christos KARAMANOLIS, Bounds on the Replication Cost for QoS, Technical Report HPL-2003-156, Hewlett-Packard Company, Palo Alto, CA, July 24, 2003. < <a href="http://www.hpl.hp.com/techreports/2003/HPL-2003-156.pdf">http://www.hpl.hp.com/techreports/2003/HPL-2003-156.pdf</a> >
	1S	Lili QIU, Venkata N. PADMANANABHAN and Geoffrey M. VOELKER, On the Placement of Web Server Replicas, INFOCOM, 2001.

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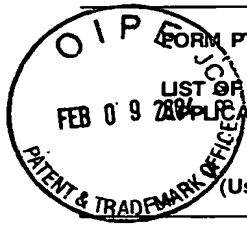
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	2P					

**OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)**

2Q	Raj TEWARI and Nabil R. ADAM, Distributed File Allocation with Consistency Constraints, 1992.
2R	Arun VENKATARAMANI, Phoebe WEIDMANN, and Mike DAHLIN, Bandwidth Constrained Placement in a WAN, 2001.
2S	Alec WOLMAN, Geoffrey M. VOELKER, Nitin SHARM, Neal CARDWELL, Anna KARLIN, and Henry M. LEVY, On the Scale and Performance of Cooperative Web Proxy Caching, Proceedings of the 17th ACM Symposium on Operating Systems Principles, Kiawah Island, SC, pages 16-31, ACM Press, New York, NY, 1999.

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## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

3Q	Kamal JAIN, Mohammad MAHDIAN, Evangelos MARKAKIS, Amin SABERI, and Vijay V. VAZIRANI, Greedy Facility Location Algorithms Analyzed Using Dual Fitting With Factor-Revealing LP, ArXiv, Cornell University, Ithica, NY, July 9, 2002. < <a href="http://arxiv.org/PS_cache/cs/pdf/0207/0207028.pdf">http://arxiv.org/PS_cache/cs/pdf/0207/0207028.pdf</a> >
3R	P. KRISHNAN, Danny RAZ, and Yuval SHAVITT, The Cache Location Problem, IEEE/ACM Transactions on Networking, Volume 8, Number 5, Pages 568-582, ACM Press, New York, NY, October 2000.
3S	Magnus KARLSSON, Christos KARAMANOLIS, and Mallik MAHALINGAM, A Framework for Evaluating Replica Placement Algorithms, Technical Report, HPL-2002-219, Hewlett-Packard Company, Palo Alto, CA, August 16, 2002. < <a href="http://www.hpl.hp.com/techreports/2002/HPL-2002-219.pdf">http://www.hpl.hp.com/techreports/2002/HPL-2002-219.pdf</a> >

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	4P					

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4Q	Magnus KARLSSON, and Mallik MAHALINGAM, Do We Need Replica Placement Algorithms in Content Delivery Networks?, Technical Report HPL-2002-220, Hewlett-Packard Company, Palo Alto, CA, August 16, 2002. < <a href="http://www.hpl.hp.com/techreports/2002/HPL-2002-220.pdf">http://www.hpl.hp.com/techreports/2002/HPL-2002-220.pdf</a> >
4R	Sridhar RAJAGOPALAN, and Vijay V. VAZIRANI, Primal-dual RNC Approximation of Covering Integer Programs, 1999.
4S	Haifeng YU, and Amin VAHDAT, Minimal Replication Cost for Availability, July 2002.

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	5M					
	5N					
	5O					
	5P					

## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

5Q	Samy MAHMOUD and J. S. RIORDON, Optimal Allocation of Resources in Distributed Information Networks, ACM Transactions on Database Systems, Volume 1, Number 1, pages 66-78, ACM Press, New York, NY, March 1976.
5R	Mark S. DASKIN and Susan H. OWEN, Partial Covering P-Center and Partial Covering Set Covering Models, Presentation, International Symposium on Location Decisions (ISOLDE VIII), Portugal, June, 23-29, 1999.
5S	Susan Hesse OWEN and Mark S. DASKIN, Strategic Facility Location: A Review, Volume 111, Issue 3, pages 423-447, European Journal of Operational Research, Elsevier Science B.V., Amsterdam, Netherlands, 1998.

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## OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

6Q	Lawrence W. DOWDY, Derrell V. FOSTER, Comparative Models of the File Assignment Problem, ACM Computing Surveys (CSUR), Volume 14, Number 2, Pages 287 - 313, ACM Press, New York, NY, June 1982.
6R	Pierre CHARDAIRE, Facility Location Optimization and Cooperative Games, Ph.D. Thesis, pages 46-62, Chapter 3 and Pages 175-184, Bibliography, School of Information Systems, University of East-Anglia, Norwich UK, 1998.
6S	Magnus KARLSSON and Christos KARAMANOLIS, 10/698,263, October 30, 2003. (Attorney Docket Number 200311960-1)

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**PATENT APPLICATION**

Sheet 7 of 7

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ATTY. DOCKET NO.

**200311961-1**

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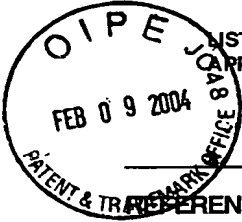
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**OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)**

7Q	Christos KARAMANOLIS, and Magnus KARLSSON 10/698,264, October 30, 2003. (Attorney Docket Number 200311962-1)
7R	Magnus KARLSSON and Christos KARAMANOLIS, 10/698,265, October 30, 2003. (Attorney Docket Number 200312448-1)
7S	

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